

<110> Kohonen-Corish, Maija  
 <120> Methods of diagnosing colorectal cancer and reagents therefor  
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	210	215	220
aaa gaa gat gat aaa acc cat gaa atg gaa cca gct gag gct att gaa			1023
Lys Glu Asp Asp Lys Thr His Glu Met Glu Pro Ala Glu Ala Ile Glu			
	225	230	235
aca cca ctg ctt cca cat caa aaa caa gct cta gct tgg atg gtg tca			1071
Thr Pro Leu Leu Pro His Gln Lys Gln Ala Leu Ala Trp Met Val Ser			
	240	245	250
cgg gaa aat agc aaa gaa ctt cca cca ttc tgg gaa cag cga aat gac			1119
Arg Glu Asn Ser Lys Glu Leu Pro Pro Phe Trp Glu Gln Arg Asn Asp			
	255	260	265
tta tac tat aac aca ata aca aat ttt tct gag aag gac cga cca gaa			1167
Leu Tyr Tyr Asn Thr Ile Thr Asn Phe Ser Glu Lys Asp Arg Pro Glu			
	270	275	280
aat gtc cat gga gga att tta gct gat gat atg ggt ttg ggt aaa act			1215
Asn Val His Gly Gly Ile Leu Ala Asp Asp Met Gly Leu Gly Lys Thr			
	290	295	300
ctt acg gcc att gca gta atc ctt acc aac ttc cat gat ggc aga cct			1263
Leu Thr Ala Ile Ala Val Ile Leu Thr Asn Phe His Asp Gly Arg Pro			
	305	310	315
ctt cct att gaa aga gtt aaa aag aat cta ctg aag aag gaa tat aat			1311
Leu Pro Ile Glu Arg Val Lys Lys Asn Leu Leu Lys Lys Glu Tyr Asn			
	320	325	330
gtt aac gat ggc tct atg aaa ctt gga gga aac aat acc agt gaa aag			1359
Val Asn Asp Gly Ser Met Lys Leu Gly Gly Asn Asn Thr Ser Glu Lys			
	335	340	345
gca gat gga cta agc aaa gac gca tct aga tgt agt gaa caa ccc agt			1407
Ala Asp Gly Leu Ser Lys Asp Ala Ser Arg Cys Ser Glu Gln Pro Ser			
	350	355	360
att tca gat atc aag gag aag agt aag ttt cgc atg tca gaa ttg tct			1455
Ile Ser Asp Ile Lys Glu Lys Ser Lys Phe Arg Met Ser Glu Leu Ser			
	370	375	380
agc tcc cgc ccc aaa aga aga aaa act gct gtc cag tac ata gaa agc			1503
Ser Ser Arg Pro Lys Arg Arg Lys Thr Ala Val Gln Tyr Ile Glu Ser			
	385	390	395
agt gat tca gag gaa att gaa aca agt gaa ttg ccg cag aaa atg aaa			1551
Ser Asp Ser Glu Glu Ile Glu Thr Ser Glu Leu Pro Gln Lys Met Lys			
	400	405	410
ggc aaa ctg aaa aat gta cag tct gaa act aaa ggc agg gcg aaa gca			1599
Gly Lys Leu Lys Asn Val Gln Ser Glu Thr Lys Gly Arg Ala Lys Ala			
	415	420	425

gga tct tct aag gtt ata gaa gat gtg gca ttt gca tgt gca tta act	1647
Gly Ser Ser Lys Val Ile Glu Asp Val Ala Phe Ala Cys Ala Leu Thr	
430 435 440 445	
tca tct gtt cct aca aca aaa aag aaa atg ttg aaa aag gga gct tgt	1695
Ser Ser Val Pro Thr Thr Lys Lys Lys Met Leu Lys Lys Gly Ala Cys	
450 455 460	
gca gtg gag ggg tca aag aaa act gat gtt gag gag aga cca aga aca	1743
Ala Val Glu Gly Ser Lys Lys Thr Asp Val Glu Glu Arg Pro Arg Thr	
465 470 475	
aca ctg atc atc tgt ccg ctt tct gtg tta agc aac tgg att gac cag	1791
Thr Leu Ile Ile Cys Pro Leu Ser Val Leu Ser Asn Trp Ile Asp Gln	
480 485 490	
ttt gga caa cat ata aaa tca gat gta cac ttg aat ttt tat gtt tat	1839
Phe Gly Gln His Ile Lys Ser Asp Val His Leu Asn Phe Tyr Val Tyr	
495 500 505	
tat ggt cct gat cgt att aga gaa ccg gcc tta ctt tca aaa cag gat	1887
Tyr Gly Pro Asp Arg Ile Arg Glu Pro Ala Leu Leu Ser Lys Gln Asp	
510 515 520 525	
att gtt ttg act acg tat aat att tta act cat gac tat gga act aaa	1935
Ile Val Leu Thr Thr Tyr Asn Ile Leu Thr His Asp Tyr Gly Thr Lys	
530 535 540	
gga gat agt cca tta cat agc ata agg tgg cta aga gtg atc ctg gat	1983
Gly Asp Ser Pro Leu His Ser Ile Arg Trp Leu Arg Val Ile Leu Asp	
545 550 555	
gaa gga cat gcc ata cga aat cca aat gct cag cag aca aaa gct gta	2031
Glu Gly His Ala Ile Arg Asn Pro Asn Ala Gln Gln Thr Lys Ala Val	
560 565 570	
ctt gac tta gaa tca gaa aga aga tgg gtt ttg aca ggt act cca atc	2079
Leu Asp Leu Glu Ser Glu Arg Arg Trp Val Leu Thr Gly Thr Pro Ile	
575 580 585	
cag aat tct tta aag gac ttg tgg tct ctt ctt tcc ttt tta aaa ctt	2127
Gln Asn Ser Leu Lys Asp Leu Trp Ser Leu Leu Ser Phe Leu Lys Leu	
590 595 600 605	
aaa cca ttt att gat aga gaa tgg tgg cat aga aca ata cag cgt cct	2175
Lys Pro Phe Ile Asp Arg Glu Trp Trp His Arg Thr Ile Gln Arg Pro	
610 615 620	
gtc aca atg gga gat gaa gga gga ctt agg cgt tta cag tcc cta att	2223
Val Thr Met Gly Asp Glu Gly Gly Leu Arg Arg Leu Gln Ser Leu Ile	
625 630 635	
aaa aat att aca ctt aga aga aca aag aca agc aaa att aaa gga aaa	2271
Lys Asn Ile Thr Leu Arg Arg Thr Lys Thr Ser Lys Ile Lys Gly Lys	
640 645 650	
cct gtt ttg gag tta cca gaa cgt aaa gta ttt att cag cac att aca	2319
Pro Val Leu Glu Leu Pro Glu Arg Lys Val Phe Ile Gln His Ile Thr	
655 660 665	

ctt tca gat gaa gag aga aag att tat cag tct gtg aaa aat gaa ggc Leu Ser Asp Glu Glu Arg Lys Ile Tyr Gln Ser Val Lys Asn Glu Gly 670 675 680 685	2367
aga gcc act att gga agg tat ttt aat gaa ggg act gtc ctg gca cat Arg Ala Thr Ile Gly Arg Tyr Phe Asn Glu Gly Thr Val Leu Ala His 690 695 700	2415
tat gca gat gtc ctg ggt ctt ttg ctt aga ctg cgg caa att tgt tgc Tyr Ala Asp Val Leu Gly Leu Leu Arg Leu Arg Gln Ile Cys Cys 705 710 715	2463
cat act tac ctt ctt aca aat gca gtg tct tcc aat ggc ccc tca gga His Thr Tyr Leu Leu Thr Asn Ala Val Ser Ser Asn Gly Pro Ser Gly 720 725 730	2511
aat gat aca cct gaa gaa ctg aga aag aag tta ata agg aag atg aag Asn Asp Thr Pro Glu Glu Leu Arg Lys Lys Leu Ile Arg Lys Met Lys 735 740 745	2559
tta att ctg agc tca ggt tca gat gag gaa tgt gca att tgc ctg gat Leu Ile Leu Ser Ser Gly Ser Asp Glu Glu Cys Ala Ile Cys Leu Asp 750 755 760 765	2607
tct tta aca gtt cct gtg ata aca cat tgt gca cat gta ttt tgt aaa Ser Leu Thr Val Pro Val Ile Thr His Cys Ala His Val Phe Cys Lys 770 775 780	2655
ccc tgt att tgc caa gtc att cag aat gag cag cca cat gct aaa tgc Pro Cys Ile Cys Gln Val Ile Gln Asn Glu Gln Pro His Ala Lys Cys 785 790 795	2703
cct tta tgc aga aat gat ata cat gaa gat aat tta tta gaa tgt cct Pro Leu Cys Arg Asn Asp Ile His Glu Asp Asn Leu Leu Glu Cys Pro 800 805 810	2751
cca gaa gaa tta gca cgt gac agt gag aaa aag tct gat atg gaa tgg Pro Glu Glu Leu Ala Arg Asp Ser Glu Lys Lys Ser Asp Met Glu Trp 815 820 825	2799
aca tcc agt tca aag att aat gcg cta atg cac gca ttg act gac tta Thr Ser Ser Ser Lys Ile Asn Ala Leu Met His Ala Leu Thr Asp Leu 830 835 840 845	2847
aga aag aag aat ccc aac ata aaa agt ttg gtt gtt tct cag ttt aca Arg Lys Lys Asn Pro Asn Ile Lys Ser Leu Val Val Ser Gln Phe Thr 850 855 860	2895
aca ttc ctg tct tta ata gaa ata cca ctt aaa gcc tct gga ttt gtg Thr Phe Leu Ser Leu Ile Glu Ile Pro Leu Lys Ala Ser Gly Phe Val 865 870 875	2943
ttt act cgt ttg gat ggt tcc atg gcc caa aag aaa aga gtt gaa tca Phe Thr Arg Leu Asp Gly Ser Met Ala Gln Lys Lys Arg Val Glu Ser 880 885 890	2991
att cag tgt ttt caa aac act gaa gca gga tct cca act ata atg ctt Ile Gln Cys Phe Gln Asn Thr Glu Ala Gly Ser Pro Thr Ile Met Leu 895 900 905	3039
ctg tcc tta aga gca ggt gga gtt ggt ttg aat ctg tct gca gct tct	3087

Leu Ser Leu Arg Ala Gly Gly Val Gly Leu Asn Leu Ser Ala Ala Ser	
910 915 920 925	
cga gtg ttt tta atg gat cca gcc tgg aat cct gct gct gaa gat cag	3135
Arg Val Phe Leu Met Asp Pro Ala Trp Asn Pro Ala Ala Glu Asp Gln	
930 935 940	
tgc ttt gac aga tgc cat aga ctt ggt cag aag caa gaa gtt atc atc	3183
Cys Phe Asp Arg Cys His Arg Leu Gly Gln Lys Gln Glu Val Ile Ile	
945 950 955	
aca aaa ttc att gta aag gac tct gtt gaa gaa aat atg ctg aaa ata	3231
Thr Lys Phe Ile Val Lys Asp Ser Val Glu Glu Asn Met Leu Lys Ile	
960 965 970	
caa aac aaa aag aga gaa ctt gca gca gga gcc ttt gga act aaa aaa	3279
Gln Asn Lys Lys Arg Glu Leu Ala Ala Gly Ala Phe Gly Thr Lys Lys	
975 980 985	
cca aat gct gac gaa atg aaa caa gcc aaa att aat gaa atc aga aca	3327
Pro Asn Ala Asp Glu Met Lys Gln Ala Lys Ile Asn Glu Ile Arg Thr	
990 995 1000 1005	
tta att gac tta taatttgtgg gatttttagta aggtcagttt gattggatac	3379
Leu Ile Asp Leu	
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aacttgagta attcatcctt acagctatct gtagaattag tcatcttttt tttttctttt	4399

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Val Gln Tyr Gly Val His Gly Asn Phe Pro Arg Leu Ser Tyr Pro Thr  
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Phe Phe Leu Arg Phe Glu Phe Gln Asp Val Ile Pro Pro Asp Asp Phe ...  
 35 40 45

Leu Thr Ser Asp Glu Glu Val Asp Ser Val Leu Phe Gly Ser Leu Arg  
 50 55 60

Gly His Val Val Gly Leu Arg Tyr Tyr Thr Gly Val Val Asn Asn Asn  
 15

65	70	75	80
Glu Met Val Ala	Leu Gln Arg Asp Pro Asn Asn Pro Tyr Asp Lys Asn		
	85	90	95
Ala Ile Lys Val	Asn Asn Val Asn Gly Asn Gln Val Gly His Leu Lys		
	100	105	110
Lys Glu Leu Ala Gly Ala Leu Ala Tyr Ile Met Asp Asn Lys Leu Ala			
	115	120	125
Gln Ile Glu Gly Val Val Pro Phe Gly Ala Asn Asn Ala Phe Thr Met			
	130	135	140
Pro Leu His Met Thr Phe Trp Gly Lys Glu Glu Asn Arg Lys Ala Val			
	145	150	155
Ser Asp Gln Leu Lys Lys His Gly Phe Lys Leu Gly Pro Ala Pro Lys			
	165	170	175
Thr Leu Gly Phe Asn Leu Glu Ser Gly Trp Gly Ser Gly Arg Ala Gly			
	180	185	190
Pro Ser Tyr Ser Met Pro Val His Ala Ala Val Gln Met Thr Thr Glu			
	195	200	205
Gln Leu Lys Thr Glu Phe Asp Lys Leu Phe Glu Asp Leu Lys Glu Asp			
	210	215	220
Asp Lys Thr His Glu Met Glu Pro Ala Glu Ala Ile Glu Thr Pro Leu			
	225	230	235
Leu Pro His Gln Lys Gln Ala Leu Ala Trp Met Val Ser Arg Glu Asn			
	245	250	255
Ser Lys Glu Leu Pro Pro Phe Trp Glu Gln Arg Asn Asp Leu Tyr Tyr			
	260	265	270
Asn Thr Ile Thr Asn Phe Ser Glu Lys Asp Arg Pro Glu Asn Val His			
	275	280	285
Gly Gly Ile Leu Ala Asp Asp Met Gly Leu Gly Lys Thr Leu Thr Ala			
	290	295	300
Ile Ala Val Ile Leu Thr Asn Phe His Asp Gly Arg Pro Leu Pro Ile			
	305	310	315
			320



Glu Arg Val Lys Lys Asn Leu Leu Lys Lys Glu Tyr Asn Val Asn Asp  
 325 330 335

Gly Ser Met Lys Leu Gly Gly Asn Asn Thr Ser Glu Lys Ala Asp Gly  
 340 345 350

Leu Ser Lys Asp Ala Ser Arg Cys Ser Glu Gln Pro Ser Ile Ser Asp  
 355 360 365

Ile Lys Glu Lys Ser Lys Phe Arg Met Ser Glu Leu Ser Ser Ser Arg  
 370 375 380

Pro Lys Arg Arg Lys Thr Ala Val Gln Tyr Ile Glu Ser Ser Asp Ser  
 385 390 395 400

Glu Glu Ile Glu Thr Ser Glu Leu Pro Gln Lys Met Lys Gly Lys Leu  
 405 410 415

Lys Asn Val Gln Ser Glu Thr Lys Gly Arg Ala Lys Ala Gly Ser Ser  
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Lys Val Ile Glu Asp Val Ala Phe Ala Cys Ala Leu Thr Ser Ser Val  
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Pro Thr Thr Lys Lys Lys Met Leu Lys Lys Gly Ala Cys Ala Val Glu  
 450 455 460

Gly Ser Lys Lys Thr Asp Val Glu Glu Arg Pro Arg Thr Thr Leu Ile  
 465 470 475 480

Ile Cys Pro Leu Ser Val Leu Ser Asn Trp Ile Asp Gln Phe Gly Gln  
 485 490 495

His Ile Lys Ser Asp Val His Leu Asn Phe Tyr Val Tyr Tyr Gly Pro  
 500 505 510

Asp Arg Ile Arg Glu Pro Ala Leu Leu Ser Lys Gln Asp Ile Val Leu  
 515 520 525

Thr Thr Tyr Asn Ile Leu Thr His Asp Tyr Gly Thr Lys Gly Asp Ser  
 530 535 540

Pro Leu His Ser Ile Arg Trp Leu Arg Val Ile Leu Asp Glu Gly His  
 545 550 555 560

Ala Ile Arg Asn Pro Asn Ala Gln Gln Thr Lys Ala Val Leu Asp Leu  
 565 570 575

Glu Ser Glu Arg Arg Trp Val Leu Thr Gly Thr Pro Ile Gln Asn Ser  
 580 585 590

Leu Lys Asp Leu Trp Ser Leu Leu Ser Phe Leu Lys Leu Lys Pro Phe  
 595 600 605

Ile Asp Arg Glu Trp Trp His Arg Thr Ile Gln Arg Pro Val Thr Met  
 610 615 620

Gly Asp Glu Gly Gly Leu Arg Arg Leu Gln Ser Leu Ile Lys Asn Ile  
 625 630 635 640

Thr Leu Arg Arg Thr Lys Thr Ser Lys Ile Lys Gly Lys Pro Val Leu  
 645 650 655

Glu Leu Pro Glu Arg Lys Val Phe Ile Gln His Ile Thr Leu Ser Asp  
 660 665 670

Glu Glu Arg Lys Ile Tyr Gln Ser Val Lys Asn Glu Gly Arg Ala Thr  
 675 685

Ile Gly Arg Tyr Phe Asn Glu Gly Thr Val Leu Ala His Tyr Ala Asp  
 690 695 700

Val Leu Gly Leu Leu Leu Arg Leu Arg Gln Ile Cys Cys His Thr Tyr  
 705 710 715 720

Leu Leu Thr Asn Ala Val Ser Ser Asn Gly Pro Ser Gly Asn Asp Thr  
 725 730 735

Pro Glu Glu Leu Arg Lys Lys Leu Ile Arg Lys Met Lys Leu Ile Leu  
 740 745 750

Ser Ser Gly Ser Asp Glu Glu Cys Ala Ile Cys Leu Asp Ser Leu Thr  
 755 760 765

Val Pro Val Ile Thr His Cys Ala His Val Phe Cys Lys Pro Cys Ile  
 770 775 780

Cys Gln Val Ile Gln Asn Glu Gln Pro His Ala Lys Cys Pro Leu Cys  
 785 790 795 800

Arg Asn Asp Ile His Glu Asp Asn Leu Leu Glu Cys Pro Pro Glu Glu  
805 810 815

Leu Ala Arg Asp Ser Glu Lys Lys Ser Asp Met Glu Trp Thr Ser Ser  
820 825 830

Ser Lys Ile Asn Ala Leu Met His Ala Leu Thr Asp Leu Arg Lys Lys  
835 840 845

Asn Pro Asn Ile Lys Ser Leu Val Val Ser Gln Phe Thr Thr Phe Leu  
850 855 860

Ser Leu Ile Glu Ile Pro Leu Lys Ala Ser Gly Phe Val Phe Thr Arg  
865 870 875 880

Leu Asp Gly Ser Met Ala Gln Lys Lys Arg Val Glu Ser Ile Gln Cys  
885 890 895

Phe Gln Asn Thr Glu Ala Gly Ser Pro Thr Ile Met Leu Leu Ser Leu  
900 905 910

Arg Ala Gly Gly Val Gly Leu Asn Leu Ser Ala Ala Ser Arg Val Phe  
915 920 925

Leu Met Asp Pro Ala Trp Asn Pro Ala Ala Glu Asp Gln Cys Phe Asp  
930 935 940

Arg Cys His Arg Leu Gly Gln Lys Gln Glu Val Ile Ile Thr Lys Phe  
945 950 955 960

Ile Val Lys Asp Ser Val Glu Glu Asn Met Leu Lys Ile Gln Asn Lys  
965 970 975

Lys Arg Glu Leu Ala Ala Gly Ala Phe Gly Thr Lys Lys Pro Asn Ala  
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Asp Glu Met Lys Gln Ala Lys Ile Asn Glu Ile Arg Thr Leu Ile Asp  
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Leu

<210> 6  
<211> 887  
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Asn Asn Ala Phe Thr Met Pro Leu His Met Thr Phe Trp Gly Lys Glu  
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Glu Asn Arg Lys Ala Val Ser Asp Gln Leu Lys Lys His Gly Phe Lys  
35 40 45

Leu Gly Pro Ala Pro Lys Thr Leu Gly Phe Asn Leu Glu Ser Gly Trp  
50 55 60

Gly Ser Gly Arg Ala Gly Pro Ser Tyr Ser Met Pro Val His Ala Ala  
65 70 75 80

Val Gln Met Thr Thr Glu Gln Leu Lys Thr Glu Phe Asp Lys Leu Phe  
85 90 95

Glu Asp Leu Lys Glu Asp Asp Lys Thr His Glu Met Glu Pro Ala Glu  
100 105 110

Ala Ile Glu Thr Pro Leu Leu Pro His Gln Lys Gln Ala Leu Ala Trp  
115 120 125

Met Val Ser Arg Glu Asn Ser Lys Glu Leu Pro Pro Phe Trp Glu Gln  
130 135 140

Arg Asn Asp Leu Tyr Tyr Asn Thr Ile Thr Asn Phe Ser Glu Lys Asp  
145 150 155 160

Arg Pro Glu Asn Val His Gly Gly Ile Leu Ala Asp Asp Met Gly Leu  
165 170 175

Gly Lys Thr Leu Thr Ala Ile Ala Val Ile Leu Thr Asn Phe His Asp  
180 185 190

Gly Arg Pro Leu Pro Ile Glu Arg Val Lys Lys Asn Leu Leu Lys Lys  
195 200 205

Glu Tyr Asn Val Asn Asp Gly Ser Met Lys Leu Gly Gly Asn Asn Thr  
210 215 220

Ser Glu Lys Ala Asp Gly Leu Ser Lys Asp Ala Ser Arg Cys Ser Glu  
225 230 235 240

Gln Pro Ser Ile Ser Asp Ile Lys Glu Lys Ser Lys Phe Arg Met Ser  
 245 250 255  
 Glu Leu Ser Ser Ser Arg Pro Lys Arg Arg Lys Thr Ala Val Gln Tyr  
 260 265 270  
 Ile Glu Ser Ser Asp Ser Glu Glu Ile Glu Thr Ser Glu Leu Pro Gln  
 275 280 285  
 Lys Met Lys Gly Lys Leu Lys Asn Val Gln Ser Glu Thr Lys Gly Arg  
 290 295 300  
 Ala Lys Ala Gly Ser Ser Lys Val Ile Glu Asp Val Ala Phe Ala Cys  
 305 310 315 320  
 Ala Leu Thr Ser Ser Val Pro Thr Thr Lys Lys Lys Met Leu Lys Lys  
 325 330 335  
 Gly Ala Cys Ala Val Glu Gly Ser Lys Lys Thr Asp Val Glu Glu Arg  
 340 345 350  
 Pro Arg Thr Thr Leu Ile Ile Cys Pro Leu Ser Val Leu Ser Asn Trp  
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 Ile Asp Gln Phe Gly Gln His Ile Lys Ser Asp Val His Leu Asn Phe  
 370 375 380  
 Tyr Val Tyr Tyr Gly Pro Asp Arg Ile Arg Glu Pro Ala Leu Leu Ser  
 385 390 395 400  
 Lys Gln Asp Ile Val Leu Thr Thr Tyr Asn Ile Leu Thr His Asp Tyr  
 405 410 415  
 Gly Thr Lys Gly Asp Ser Pro Leu His Ser Ile Arg Trp Leu Arg Val  
 420 425 430  
 Ile Leu Asp Glu Gly His Ala Ile Arg Asn Pro Asn Ala Gln Gln Thr  
 435 440 445  
 Lys Ala Val Leu Asp Leu Glu Ser Glu Arg Arg Trp Val Leu Thr Gly  
 450 455 460  
 Thr Pro Ile Gln Asn Ser Leu Lys Asp Leu Trp Ser Leu Leu Ser Phe  
 465 470 475 480

Leu Lys Leu Lys Pro Phe Ile Asp Arg Glu Trp Trp His Arg Thr Ile  
485 490 495

Gln Arg Pro Val Thr Met Gly Asp Glu Gly Gly Leu Arg Arg Leu Gln  
500 505 510

Ser Leu Ile Lys Asn Ile Thr Leu Arg Arg Thr Lys Thr Ser Lys Ile  
515 520 525

Lys Gly Lys Pro Val Leu Glu Leu Pro Glu Arg Lys Val Phe Ile Gln  
530 535 540

His Ile Thr Leu Ser Asp Glu Glu Arg Lys Ile Tyr Gln Ser Val Lys  
545 550 555 560

Asn Glu Gly Arg Ala Thr Ile Gly Arg Tyr Phe Asn Glu Gly Thr Val  
565 570 575

Leu Ala His Tyr Ala Asp Val Leu Gly Leu Leu Leu Arg Leu Arg Gln  
580 585 590

Ile Cys Cys His Thr Tyr Leu Leu Thr Asn Ala Val Ser Ser Asn Gly  
595 600 605

Pro Ser Gly Asn Asp Thr Pro Glu Glu Leu Arg Lys Lys Leu Ile Arg  
610 615 620

Lys Met Lys Leu Ile Leu Ser Ser Gly Ser Asp Glu Glu Cys Ala Ile  
625 630 635 640

Cys Leu Asp Ser Leu Thr Val Pro Val Ile Thr His Cys Ala His Val  
645 650 655

Phe Cys Lys Pro Cys Ile Cys Gln Val Ile Gln Asn Glu Gln Pro His  
660 665 670

Ala Lys Cys Pro Leu Cys Arg Asn Asp Ile His Glu Asp Asn Leu Leu  
675 680 685

Glu Cys Pro Pro Glu Glu Leu Ala Arg Asp Ser Glu Lys Lys Ser Asp  
690 695 700

Met Glu Trp Thr Ser Ser Ser Lys Ile Asn Ala Leu Met His Ala Leu  
705 710 715 720

Thr Asp Leu Arg Lys Lys Asn Pro Asn Ile Lys Ser Leu Val Val Ser  
22

725										730					735				
Gln	Phe	Thr	Thr	Phe	Leu	Ser	Leu	Ile	Glu	Ile	Pro	Leu	Lys	Ala	Ser				
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Gly	Phe	Val	Phe	Thr	Arg	Leu	Asp	Gly	Ser	Met	Ala	Gln	Lys	Lys	Arg				
		755					760					765							
Val	Glu	Ser	Ile	Gln	Cys	Phe	Gln	Asn	Thr	Glu	Ala	Gly	Ser	Pro	Thr				
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Ile	Met	Leu	Leu	Ser	Leu	Arg	Ala	Gly	Gly	Val	Gly	Leu	Asn	Leu	Ser				
785					790					795					800				
Ala	Ala	Ser	Arg	Val	Phe	Leu	Met	Asp	Pro	Ala	Trp	Asn	Pro	Ala	Ala				
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Glu	Asp	Gln	Cys	Phe	Asp	Arg	Cys	His	Arg	Leu	Gly	Gln	Lys	Gln	Glu				
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Val	Ile	Ile	Thr	Lys	Phe	Ile	Val	Lys	Asp	Ser	Val	Glu	Glu	Asn	Met				
			835				840					845							
Leu	Lys	Ile	Gln	Asn	Lys	Lys	Arg	Glu	Leu	Ala	Ala	Gly	Ala	Phe	Gly				
	850					855					860								
Thr	Lys	Lys	Pro	Asn	Ala	Asp	Glu	Met	Lys	Gln	Ala	Lys	Ile	Asn	Glu				
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1				5				10					15			
ctc ttc gga gct tcc ttg ctc agc gcg cat ctt caa gta acc ggt ttt																96
Leu	Phe	Gly	Ala	Ser	Leu	Leu	Ser	Ala	His	Leu	Gln	Val	Thr	Gly	Phe	
			20					25					30			

caa att aaa gct ttc aca gca ctg cgc ttc ctc tca gaa cct tct gat	144
Gln Ile Lys Ala Phe Thr Ala Leu Arg Phe Leu Ser Glu Pro Ser Asp	
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gcc gtc aca atg cgg gga gga aat gtc ctc ctc gac tgc tcc gcg gag	192
Ala Val Thr Met Arg Gly Gly Asn Val Leu Leu Asp Cys Ser Ala Glu	
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Ser Asp Arg Gly Val Pro Val Ile Lys Trp Lys Lys Asp Gly Ile His	
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ctg gcc ttg gga atg gat gaa agg aag cag caa ctt tca aat ggg tct	288
Leu Ala Leu Gly Met Asp Glu Arg Lys Gln Gln Leu Ser Asn Gly Ser	
85 90 95	
ctg ctg ata caa aac ata ctt cat tcc aga cac cac aag cca gat gag	336
Leu Leu Ile Gln Asn Ile Leu His Ser Arg His His Lys Pro Asp Glu	
100 105 110	
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Gly Leu Tyr Gln Cys Glu Ala Ser Leu Gly Asp Ser Gly Ser Ile Ile	
115 120 125	
agt cgg aca gca aaa gtt gca gta gca gga cca ctg agg ttc ctt tca	432
Ser Arg Thr Ala Lys Val Ala Val Ala Gly Pro Leu Arg Phe Leu Ser	
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Gln Thr Glu Ser Val Thr Ala Phe Met Gly Asp Thr Val Leu Leu Lys	
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Cys Glu Val Ile Gly Glu Pro Met Pro Thr Ile His Trp Gln Lys Asn	
165 170 175	
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Gln Gln Asp Leu Thr Pro Ile Pro Gly Asp Ser Arg Val Val Val Leu	
180 185 190	
ccc tct gga gca ttg cag atc agc cga ctc caa ccg ggg gac att gga	624
Pro Ser Gly Ala Leu Gln Ile Ser Arg Leu Gln Pro Gly Asp Ile Gly	
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Ile Tyr Arg Cys Ser Ala Arg Asn Pro Ala Ser Ser Arg Thr Gly Asn	
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Glu Ala Glu Val Arg Ile Leu Ser Asp Pro Gly Leu His Arg Gln Leu	
225 230 235 240	
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Tyr Phe Leu Gln Arg Pro Ser Asn Val Val Ala Ile Glu Gly Lys Asp	
245 250 255	
gct gtc ctg gaa tgt tgt gtt tct ggc tat cct cca cca agt ttt acc	816
Ala Val Leu Glu Cys Cys Val Ser Gly Tyr Pro Pro Pro Ser Phe Thr	
260 265 270	





Ser	Ser	Gln	Pro	Ile	Lys	Val	Ala	Thr	Gln	Pro	Glu	Leu	Gln	Val	Pro	
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Gly	Pro	Val	Glu	Asn	Leu	Gln	Ala	Val	Ser	Thr	Ser	Pro	Thr	Ser	Ile	
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ctt	att	acc	tgg	gaa	ccc	cct	gcc	tat	gca	aac	ggg	cca	gtc	caa	ggg	1680
Leu	Ile	Thr	Trp	Glu	Pro	Pro	Ala	Tyr	Ala	Asn	Gly	Pro	Val	Gln	Gly	
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Tyr	Arg	Leu	Phe	Cys	Thr	Glu	Val	Ser	Thr	Gly	Lys	Glu	Gln	Asn	Ile	
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gag	gtt	gat	gga	cta	tct	tat	aaa	ctg	gaa	ggc	ctg	aaa	aaa	ttc	acc	1776
Glu	Val	Asp	Gly	Leu	Ser	Tyr	Lys	Leu	Glu	Gly	Leu	Lys	Lys	Phe	Thr	
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Glu	Tyr	Ser	Leu	Arg	Phe	Leu	Ala	Tyr	Asn	Arg	Tyr	Gly	Pro	Gly	Val	
		595					600					605				
tct	act	gat	gat	ata	aca	gtg	gtt	aca	ctt	tct	gac	gtg	cca	agt	gcc	1872
Ser	Thr	Asp	Asp	Ile	Thr	Val	Val	Thr	Leu	Ser	Asp	Val	Pro	Ser	Ala	
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ccg	cct	cag	aac	gtc	tcc	ctg	gaa	gtg	gtc	aat	tca	aga	agt	atc	aaa	1920
Pro	Pro	Gln	Asn	Val	Ser	Leu	Glu	Val	Val	Asn	Ser	Arg	Ser	Ile	Lys	
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gtt	agc	tgg	ctg	cct	cct	cca	tca	gga	aca	caa	aat	gga	ttt	att	acc	1968
Val	Ser	Trp	Leu	Pro	Pro	Pro	Ser	Gly	Thr	Gln	Asn	Gly	Phe	Ile	Thr	
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ggc	tat	aaa	att	cga	cac	aga	aag	acg	acc	cgc	agg	ggg	gag	atg	gaa	2016
Gly	Tyr	Lys	Ile	Arg	His	Arg	Lys	Thr	Thr	Arg	Arg	Gly	Glu	Met	Glu	
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aca	ctg	gag	cca	aac	aac	ctc	tgg	tac	cta	ttc	aca	gga	ctg	gag	aaa	2064
Thr	Leu	Glu	Pro	Asn	Asn	Leu	Trp	Tyr	Leu	Phe	Thr	Gly	Leu	Glu	Lys	
		675					680					685				
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Gly	Pro	Pro	Ser	Asn	Trp	Tyr	Thr	Ala	Glu	Thr	Pro	Glu	Asn	Asp	Leu	
705					710					715					720	
gat	gaa	tct	caa	gtt	cct	gat	caa	cca	agc	tct	ctt	cat	gtg	agg	ccc	2208
Asp	Glu	Ser	Gln	Val	Pro	Asp	Gln	Pro	Ser	Ser	Leu	His	Val	Arg	Pro	
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cag	act	aac	tgc	atc	atc	atg	agt	tgg	act	cct	ccc	ttg	aac	cca	aac	2256
Gln	Thr	Asn	Cys	Ile	Ile	Met	Ser	Trp	Thr	Pro	Pro	Leu	Asn	Pro	Asn	
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Ile	Val	Val	Arg	Gly	Tyr	Ile	Ile	Gly	Tyr	Gly	Val	Gly	Ser	Pro	Tyr	

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Ala	Glu	Thr	Val	Arg	Val	Asp	Ser	Lys	Gln	Arg	Tyr	Tyr	Ser	Ile	Glu	
770					775					780						
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Arg	Leu	Glu	Ser	Ser	Ser	His	Tyr	Val	Ile	Ser	Leu	Lys	Ala	Phe	Asn	
785					790					795					800	
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Asn	Ala	Gly	Glu	Gly	Val	Pro	Leu	Tyr	Glu	Ser	Ala	Thr	Thr	Arg	Ser	
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Ile	Thr	Asp	Pro	Thr	Asp	Pro	Val	Asp	Tyr	Tyr	Pro	Leu	Leu	Asp	Asp	
820					825					830						
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Phe	Pro	Thr	Ser	Val	Pro	Asp	Leu	Ser	Thr	Pro	Met	Leu	Pro	Pro	Val	
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Gly	Val	Gln	Ala	Val	Ala	Leu	Thr	His	Asp	Ala	Val	Arg	Val	Ser	Trp	
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Ala	Asp	Asn	Ser	Val	Pro	Lys	Asn	Gln	Lys	Thr	Ser	Glu	Val	Arg	Leu	
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Tyr	Thr	Val	Arg	Trp	Arg	Thr	Ser	Phe	Ser	Ala	Ser	Ala	Lys	Tyr	Lys	
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Ser	Glu	Asp	Thr	Thr	Ser	Leu	Ser	Tyr	Thr	Ala	Thr	Gly	Leu	Lys	Pro	
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Asn	Thr	Met	Tyr	Glu	Phe	Ser	Val	Met	Val	Thr	Lys	Asn	Arg	Arg	Ser	
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Ser	Thr	Trp	Ser	Met	Thr	Ala	His	Ala	Thr	Thr	Tyr	Glu	Ala	Ala	Pro	
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Thr	Ser	Ala	Pro	Lys	Asp	Phe	Thr	Val	Ile	Thr	Arg	Glu	Gly	Lys	Pro	
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cgt	gcc	gtc	att	gtg	agt	tgg	cag	cct	ccc	ttg	gaa	gcc	aat	ggg	aaa	2928
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Ile	Thr	Ala	Tyr	Ile	Leu	Phe	Tyr	Thr	Leu	Asp	Lys	Asn	Ile	Pro	Ile	
980					985					990						
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Ala Arg Asn Ser Lys Gly Val Gly Pro Leu Ser Asp Pro Ile Leu	
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ttc agg act ctg aaa gtg gaa cac cct gac aaa atg gct aat gac	3159
Phe Arg Thr Leu Lys Val Glu His Pro Asp Lys Met Ala Asn Asp	
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Gln Gly Arg His Gly Asp Gly Gly Tyr Trp Pro Val Asp Thr Asn	
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ttg att gat aga agc acc cta aat gag ccg cca att gga caa atg	3249
Leu Ile Asp Arg Ser Thr Leu Asn Glu Pro Pro Ile Gly Gln Met	
1070 1075 1080	
cac ccc ccg cat ggc agt gtc act cct cag aag aac agc aac ctg	3294
His Pro Pro His Gly Ser Val Thr Pro Gln Lys Asn Ser Asn Leu	
1085 1090 1095	
ctt gtg atc att gtg gtc acc gtt ggt gtc atc aca gtg ctg gta	3339
Leu Val Ile Ile Val Val Thr Val Gly Val Ile Thr Val Leu Val	
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Gln Arg Lys Lys Arg Ala Thr His Ser Ala Gly Lys Arg Lys Gly	
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Ser Gln Lys Asp Leu Arg Pro Pro Asp Leu Trp Ile His His Glu	
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Glu Met Glu Met Lys Asn Ile Glu Lys Pro Ser Gly Thr Asp Pro	
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gca gga agg gac tct ccc atc caa agt tgc caa gac ctc aca cca	3564
Ala Gly Arg Asp Ser Pro Ile Gln Ser Cys Gln Asp Leu Thr Pro	
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Val Ser His Ser Gln Ser Glu Thr Gln Leu Gly Ser Lys Ser Thr	
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Ser His Ser Gly Gln Asp Thr Glu Glu Ala Gly Ser Ser Met Ser	
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Thr Leu Glu Arg Ser Leu Ala Ala Arg Arg Ala Pro Arg Ala Lys	
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Ile Leu Pro Ser Pro Thr Cys Gly Tyr Pro His Pro Gln Phe Thr	
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Leu Arg Pro Val Pro Phe Pro Thr Leu Ser Val Asp Arg Gly Phe	
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Gln Pro Pro Met Leu Pro Pro Ser Gln Pro Glu His Ser Ser Ser	
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Glu Glu Ala Pro Ser Arg Thr Ile Pro Thr Ala Cys Val Arg Pro	
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Met Ser Ala Ile Glu Pro Lys Val Pro Tyr Thr Pro Leu Leu Ser	
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Gln Pro Gly Pro Thr Leu Pro Lys Thr His Val Lys Thr Ala Ser	
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Leu Gly Leu Ala Gly Lys Ala Arg Ser Pro Leu Leu Pro Val Ser	
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Val Pro Thr Ala Pro Glu Val Ser Glu Glu Ser His Lys Pro Thr	
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Met Ala Ser Leu Glu Gly Leu Met Lys Gln Leu Asn Ala Ile Thr	
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Gln Ile Lys Ala Phe Thr Ala Leu Arg Phe Leu Ser Glu Pro Ser Asp  
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Ala Val Thr Met Arg Gly Gly Asn Val Leu Leu Asp Cys Ser Ala Glu  
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Leu Leu Ile Gln Asn Ile Leu His Ser Arg His His Lys Pro Asp Glu  
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Gly Leu Tyr Gln Cys Glu Ala Ser Leu Gly Asp Ser Gly Ser Ile Ile  
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Ser Arg Thr Ala Lys Val Ala Val Ala Gly Pro Leu Arg Phe Leu Ser  
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Cys Glu Val Ile Gly Glu Pro Met Pro Thr Ile His Trp Gln Lys Asn  
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Gln Gln Asp Leu Thr Pro Ile Pro Gly Asp Ser Arg Val Val Val Leu  
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Ile Tyr Arg Cys Ser Ala Arg Asn Pro Ala Ser Ser Arg Thr Gly Asn  
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Glu Ala Glu Val Arg Ile Leu Ser Asp Pro Gly Leu His Arg Gln Leu  
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Tyr Phe Leu Gln Arg Pro Ser Asn Val Val Ala Ile Glu Gly Lys Asp  
 245 250 255

Ala Val Leu Glu Cys Cys Val Ser Gly Tyr Pro Pro Pro Ser Phe Thr  
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Trp Leu Arg Gly Glu Glu Val Ile Gln Leu Arg Ser Lys Lys Tyr Ser  
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Pro Ser Asn Leu Tyr Ala Tyr Glu Ser Met Asp Ile Glu Phe Glu Cys  
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Thr Val Ser Gly Lys Pro Val Pro Thr Val Asn Trp Met Lys Asn Gly  
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Asp Val Val Ile Pro Ser Asp Tyr Phe Gln Ile Val Gly Gly Ser Asn  
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Leu Arg Ile Leu Gly Val Val Lys Ser Asp Glu Gly Phe Tyr Gln Cys  
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Val Ala Glu Asn Glu Ala Gly Asn Ala Gln Thr Ser Ala Gln Leu Ile  
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Val Pro Lys Pro Ala Ile Pro Ser Ser Ser Val Leu Pro Ser Ala Pro  
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Arg Asp Val Val Pro Val Leu Val Ser Ser Arg Phe Val Arg Leu Ser  
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Gln Pro Gly Ser Leu Gln Leu Thr Val Gly Asn Leu Lys Pro Glu Ala  
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Met Tyr Thr Phe Arg Val Val Ala Tyr Asn Glu Trp Gly Pro Gly Glu  
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Ser Ser Gln Pro Ile Lys Val Ala Thr Gln Pro Glu Leu Gln Val Pro  
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Leu Ile Thr Trp Glu Pro Pro Ala Tyr Ala Asn Gly Pro Val Gln Gly  
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Tyr Arg Leu Phe Cys Thr Glu Val Ser Thr Gly Lys Glu Gln Asn Ile  
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Glu Val Asp Gly Leu Ser Tyr Lys Leu Glu Gly Leu Lys Lys Phe Thr  
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Glu Tyr Ser Leu Arg Phe Leu Ala Tyr Asn Arg Tyr Gly Pro Gly Val  
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Ser Thr Asp Asp Ile Thr Val Val Thr Leu Ser Asp Val Pro Ser Ala  
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Pro Pro Gln Asn Val Ser Leu Glu Val Val Asn Ser Arg Ser Ile Lys  
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Val Ser Trp Leu Pro Pro Pro Ser Gly Thr Gln Asn Gly Phe Ile Thr  
 645 650 655

Gly Tyr Lys Ile Arg His Arg Lys Thr Thr Arg Arg Gly Glu Met Glu  
 660 665 670



Thr Leu Glu Pro Asn Asn Leu Trp Tyr Leu Phe Thr Gly Leu Glu Lys  
675 680 685

Gly Ser Gln Tyr Ser Phe Gln Val Ser Ala Met Thr Val Asn Gly Thr  
690 695 700

Gly Pro Pro Ser Asn Trp Tyr Thr Ala Glu Thr Pro Glu Asn Asp Leu  
705 710 715 720

Asp Glu Ser Gln Val Pro Asp Gln Pro Ser Ser Leu His Val Arg Pro  
725 730 735

Gln Thr Asn Cys Ile Ile Met Ser Trp Thr Pro Pro Leu Asn Pro Asn  
740 745 750

Ile Val Val Arg Gly Tyr Ile Ile Gly Tyr Gly Val Gly Ser Pro Tyr  
755 760 765

Ala Glu Thr Val Arg Val Asp Ser Lys Gln Arg Tyr Tyr Ser Ile Glu  
770 775 780

Arg Leu Glu Ser Ser Ser His Tyr Val Ile Ser Leu Lys Ala Phe Asn  
785 790 795 800

Asn Ala Gly Glu Gly Val Pro Leu Tyr Glu Ser Ala Thr Thr Arg Ser  
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Ile Thr Asp Pro Thr Asp Pro Val Asp Tyr Tyr Pro Leu Leu Asp Asp  
820 825 830

Phe Pro Thr Ser Val Pro Asp Leu Ser Thr Pro Met Leu Pro Pro Val  
835 840 845

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Leu Val Ile Ile Val Val Thr Val Gly Val Ile Thr Val Leu Val		
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Gln Arg Lys Lys Arg Ala Thr His Ser Ala Gly Lys Arg Lys Gly		
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Ser Gln Lys Asp Leu Arg Pro Pro Asp Leu Trp Ile His His Glu		
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Ser His 1205	Ser Gly Gln Asp Thr 1210	Glu Glu Ala Gly Ser Ser Met Ser 1215
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Ile Leu 1265	Pro Ser Pro Thr Cys 1270	Gly Tyr Pro His Pro Gln Phe Thr 1275
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Gln Pro 1310	Pro Met Leu Pro Pro 1315	Ser Gln Pro Glu His Ser Ser Ser 1320
Glu Glu 1325	Ala Pro Ser Arg Thr 1330	Ile Pro Thr Ala Cys Val Arg Pro 1335
Thr His 1340	Pro Leu Arg Ser Phe 1345	Ala Asn Pro Leu Leu Pro Pro Pro 1350
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 Arg Leu Lys Glu Leu Asn Leu Asp Ser Ser Asn Phe Pro Gly Val Lys  
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Ala Met Glu Glu Gln Leu Gly Thr Cys Gln Asp Met Glu Lys Arg Ala	
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Leu	Leu	His	Gly	Asn	Asp	Lys	Asp	Ser	Val	Leu	Leu	Gly	Asn	Ser	Arg		
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Gly	Ser	Lys	Glu	Ala	Arg	Ala	Arg	Ala	Ser	Ala	Ala	Leu	His	Asn	Ile		
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Ile	His	Ser	Gln	Pro	Asp	Asp	Lys	Arg	Gly	Arg	Arg	Glu	Ile	Arg	Val		
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Leu	His	Leu	Leu	Glu	Gln	Ile	Arg	Ala	Tyr	Cys	Glu	Thr	Cys	Trp	Glu		
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Trp	Gln	Glu	Ala	His	Glu	Pro	Gly	Met	Asp	Gln	Asp	Lys	Asn	Pro	Met		
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Pro	Ala	Pro	Val	Glu	His	Gln	Ile	Cys	Pro	Ala	Val	Cys	Val	Leu	Met		
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Lys	Leu	Ser	Phe	Asp	Glu	Glu	His	Arg	His	Ala	Met	Asn	Glu	Leu	Gly		
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Met	Ala	Leu	Thr	Asn	Leu	Thr	Phe	Gly	Asp	Val	Ala	Asn	Lys	Ala	Thr		
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cta	tgc	tct	atg	aaa	ggc	tgc	atg	aga	gca	ctt	gtg	gcc	caa	cta	aaa	1640	
Leu	Cys	Ser	Met	Lys	Gly	Cys	Met	Arg	Ala	Leu	Val	Ala	Gln	Leu	Lys		
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tct	gaa	agt	gaa	gac	tta	cag	cag	gtt	att	gca	agt	gtt	ttg	agg	aat	1688	
Ser	Glu	Ser	Glu	Asp	Leu	Gln	Gln	Val	Ile	Ala	Ser	Val	Leu	Arg	Asn		
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Leu	Ser	Trp	Arg	Ala	Asp	Val	Asn	Ser	Lys	Lys	Thr	Leu	Arg	Glu	Val		
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Cys	Thr	Glu	Asn	Lys	Ala	Asp	Ile	Cys	Ala	Val	Asp	Gly	Ala	Leu	Ala	
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Phe	Leu	Val	Gly	Thr	Leu	Thr	Tyr	Arg	Ser	Gln	Thr	Asn	Thr	Leu	Ala	
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Ile	Ile	Glu	Ser	Gly	Gly	Gly	Ile	Leu	Arg	Asn	Val	Ser	Ser	Leu	Ile	
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gct	aca	aat	gag	gac	cac	agg	caa	atc	cta	aga	gag	aac	aac	tgt	cta	2024
Ala	Thr	Asn	Glu	Asp	His	Arg	Gln	Ile	Leu	Arg	Glu	Asn	Asn	Cys	Leu	
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caa	act	tta	tta	caa	cac	tta	aaa	tct	cat	agt	ttg	aca	ata	gtc	agt	2072
Gln	Thr	Leu	Leu	Gln	His	Leu	Lys	Ser	His	Ser	Leu	Thr	Ile	Val	Ser	
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Asn	Ala	Cys	Gly	Thr	Leu	Trp	Asn	Leu	Ser	Ala	Arg	Asn	Pro	Lys	Asp	
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Gln	Glu	Ala	Leu	Trp	Asp	Met	Gly	Ala	Val	Ser	Met	Leu	Lys	Asn	Leu	
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Ile	His	Ser	Lys	His	Lys	Met	Ile	Ala	Met	Gly	Ser	Ala	Ala	Ala	Leu	
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Arg	Asn	Leu	Met	Ala	Asn	Arg	Pro	Ala	Lys	Tyr	Lys	Asp	Ala	Asn	Ile	
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Met	Ser	Pro	Gly	Ser	Ser	Leu	Pro	Ser	Leu	His	Val	Arg	Lys	Gln	Lys	
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Ala	Leu	Glu	Ala	Glu	Leu	Asp	Ala	Gln	His	Leu	Ser	Glu	Thr	Phe	Asp	
760				765				770								
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Asn	Ile	Asp	Asn	Leu	Ser	Pro	Lys	Ala	Ser	His	Arg	Ser	Lys	Gln	Arg	
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His	Lys	Gln	Ser	Leu	Tyr	Gly	Asp	Tyr	Val	Phe	Asp	Thr	Asn	Arg	His	
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Val Ser Ser Ser Asp Gly Tyr Gly Lys Arg Gly Gln Met Lys Pro Ser	
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Ile Glu Ser Tyr Ser Glu Asp Asp Glu Ser Lys Phe Cys Ser Tyr Gly	
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caa tac cca gcc gac cta gcc cat aaa ata cat agt gca aat cat	3077
Gln Tyr Pro Ala Asp Leu Ala His Lys Ile His Ser Ala Asn His	
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Phe Gln	Pro His	Phe Gly	Gln	Gln Glu	Cys Val	Ser	Pro Tyr	Arg	
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His Gly	Ile Asn	Gln Asn	Val	Ser Gln	Ser Leu	Cys	Gln Glu	Asp	
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Asp Tyr	Glu Asp	Asp Lys	Pro	Thr Asn	Tyr Ser	Glu	Arg Tyr	Ser	
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Glu Glu	Glu Gln	His Glu	Glu	Glu Glu	Arg Pro	Thr	Asn Tyr	Ser	
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Ile Cys	Phe Ser	Arg Cys	Ser	Ser Leu	Ser Ser	Leu	Ser Ser	Ala	
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Ala Asn	Thr Leu	Gln Ile	Ala	Glu Ile	Lys Glu	Lys Ile	Gly Thr	
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agg tca	gct gaa	gat cct	gtg	agc gaa	gtt cca	gca gtg	tca cag	4022
Arg Ser	Ala Glu	Asp Pro	Val	Ser Glu	Val Pro	Ala Val	Ser Gln	
1315			1320			1325		
cac cct	aga acc	aaa tcc	agc	aga ctg	cag ggt	tct agt	tta tct	4067
His Pro	Arg Thr	Lys Ser	Ser	Arg Leu	Gln Gly	Ser Ser	Leu Ser	
1330			1335			1340		
tca gaa	tca gcc	agg cac	aaa	gct gtt	gaa ttt	tct tca	gga gcg	4112
Ser Glu	Ser Ala	Arg His	Lys	Ala Val	Glu Phe	Ser Ser	Gly Ala	
1345			1350			1355		
aaa tct	ccc tcc	aaa agt	ggt	gct cag	aca ccc	aaa agt	cca cct	4157
Lys Ser	Pro Ser	Lys Ser	Gly	Ala Gln	Thr Pro	Lys Ser	Pro Pro	
1360			1365			1370		
gaa cac	tat gtt	cag gag	acc	cca ctc	atg ttt	agc aga	tgt act	4202
Glu His	Tyr Val	Gln Glu	Thr	Pro Leu	Met Phe	Ser Arg	Cys Thr	
1375			1380			1385		
tct gtc	agt tca	ctt gat	agt	ttt gag	agt cgt	tcg att	gcc agc	4247
Ser Val	Ser Ser	Leu Asp	Ser	Phe Glu	Ser Arg	Ser Ile	Ala Ser	
1390			1395			1400		
tcc gtt	cag agt	gaa cca	tgc	agt gga	atg gta	agt ggc	att ata	4292
Ser Val	Gln Ser	Glu Pro	Cys	Ser Gly	Met Val	Ser Gly	Ile Ile	
1405			1410			1415		
agc ccc	agt gat	ctt cca	gat	agc cct	gga caa	acc atg	cca cca	4337
Ser Pro	Ser Asp	Leu Pro	Asp	Ser Pro	Gly Gln	Thr Met	Pro Pro	
1420			1425			1430		
agc aga	agt aaa	aca cct	cca	cca cct	cct caa	aca gct	caa acc	4382
Ser Arg	Ser Lys	Thr Pro	Pro	Pro Pro	Pro Gln	Thr Ala	Gln Thr	
1435			1440			1445		
aag cga	gaa gta	cct aaa	aat	aaa gca	cct act	gct gaa	aag aga	4427
Lys Arg	Glu Val	Pro Lys	Asn	Lys Ala	Pro Thr	Ala Glu	Lys Arg	
1450			1455			1460		
gag agt	gga cct	aag caa	gct	gca gta	aat gct	gca gtt	cag agg	4472
Glu Ser	Gly Pro	Lys Gln	Ala	Ala Val	Asn Ala	Ala Val	Gln Arg	
1465			1470			1475		
gtc cag	gtt ctt	cca gat	gct	gat act	tta tta	cat ttt	gcc acg	4517
Val Gln	Val Leu	Pro Asp	Ala	Asp Thr	Leu Leu	His Phe	Ala Thr	
1480			1485			1490		
gaa agt	act cca	gat gga	ttt	tct tgt	tca tcc	agc ctg	agt gct	4562
Glu Ser	Thr Pro	Asp Gly	Phe	Ser Cys	Ser Ser	Ser Leu	Ser Ala	
1495			1500			1505		
ctg agc	ctc gat	gag cca	ttt	ata cag	aaa gat	gtg gaa	tta aga	4607
Leu Ser	Leu Asp	Glu Pro	Phe	Ile Gln	Lys Asp	Val Glu	Leu Arg	

1510	1515	1520	
ata atg cct cca gtt cag gaa Ile Met Pro Pro Val Gln Glu 1525	aat gac aat ggg aat Asn Asp Asn Gly Asn 1530	gaa aca gaa Glu Thr Glu 1535	4652
tca gag cag cct aaa gaa tca Ser Glu Gln Pro Lys Glu Ser 1540	aat gaa aac caa gag Asn Glu Asn Gln Glu 1545	aaa gag gca Lys Glu Ala 1550	4697
gaa aaa act att gat tct gaa Glu Lys Thr Ile Asp Ser Glu 1555	aag gac cta tta gat Lys Asp Leu Leu Asp 1560	gat tca gat Asp Ser Asp 1565	4742
gat gat gat att gaa ata cta Asp Asp Asp Ile Glu Ile Leu 1570	gaa gaa tgt att att Glu Glu Cys Ile Ile 1575	tct gcc atg Ser Ala Met 1580	4787
cca aca aag tca tca cgt aaa Pro Thr Lys Ser Ser Arg Lys 1585	gca aaa aag cca gcc Ala Lys Lys Pro Ala 1590	cag act gct Gln Thr Ala 1595	4832
tca aaa tta cct cca cct gtg Ser Lys Leu Pro Pro Pro Val 1600	gca agg aaa cca agt Ala Arg Lys Pro Ser 1605	cag ctg cct Gln Leu Pro 1610	4877
gtg tac aaa ctt cta cca tca Val Tyr Lys Leu Leu Pro Ser 1615	caa aac agg ttg caa Gln Asn Arg Leu Gln 1620	ccc caa aag Pro Gln Lys 1625	4922
cat gtt agt ttt aca ccg ggg His Val Ser Phe Thr Pro Gly 1630	gat gat atg cca cgg Asp Asp Met Pro Arg 1635	gtg tat tgt Val Tyr Cys 1640	4967
gtt gaa ggg aca cct ata aac Val Glu Gly Thr Pro Ile Asn 1645	ttt tcc aca gct aca Phe Ser Thr Ala Thr 1650	tct cta agt Ser Leu Ser 1655	5012
gat cta aca atc gaa tcc cct Asp Leu Thr Ile Glu Ser Pro 1660	cca aat gag tta gct Pro Asn Glu Leu Ala 1665	gct gga gaa Ala Gly Glu 1670	5057
gga gtt aga gga gga gca cag Gly Val Arg Gly Gly Ala Gln 1675	tca ggt gaa ttt gaa Ser Gly Glu Phe Glu 1680	aaa cga gat Lys Arg Asp 1685	5102
acc att cct aca gaa ggc aga Thr Ile Pro Thr Glu Gly Arg 1690	agt aca gat gag gct Ser Thr Asp Glu Ala 1695	caa gga gga Gln Gly Gly 1700	5147
aaa acc tca tct gta acc ata Lys Thr Ser Ser Val Thr Ile 1705	cct gaa ttg gat gac Pro Glu Leu Asp Asp 1710	aat aaa gca Asn Lys Ala 1715	5192
gag gaa ggt gat att ctt gca Glu Glu Gly Asp Ile Leu Ala 1720	gaa tgc att aat tct Glu Cys Ile Asn Ser 1725	gct atg ccc Ala Met Pro 1730	5237
aaa ggg aaa agt cac aag cct Lys Gly Lys Ser His Lys Pro 1735	ttc cgt gtg aaa aag Phe Arg Val Lys Lys 1740	ata atg gac Ile Met Asp 1745	5282

cag gtc	cag caa gca tct gcg	tcg tct tct gca ccc	aac aaa aat	5327
Gln Val	Gln Gln Ala Ser Ala	Ser Ser Ser Ala Pro	Asn Lys Asn	
1750	1755	1760		
cag tta	gat ggt aag aaa aag	aaa cca act tca cca	gta aaa cct	5372
Gln Leu	Asp Gly Lys Lys Lys	Lys Pro Thr Ser Pro	Val Lys Pro	
1765	1770	1775		
ata cca	caa aat act gaa tat	agg aca cgt gta aga	aaa aat gca	5417
Ile Pro	Gln Asn Thr Glu Tyr	Arg Thr Arg Val Arg	Lys Asn Ala	
1780	1785	1790		
gac tca	aaa aat aat tta aat	gct gag aga gtt ttc	tca gac aac	5462
Asp Ser	Lys Asn Asn Leu Asn	Ala Glu Arg Val Phe	Ser Asp Asn	
1795	1800	1805		
aaa gat	tca aag aaa cag aat	ttg aaa aat aat tcc	aag gac ttc	5507
Lys Asp	Ser Lys Lys Gln Asn	Leu Lys Asn Asn Ser	Lys Asp Phe	
1810	1815	1820		
aat gat	aag ctc cca aat aat	gaa gat aga gtc aga	gga agt ttt	5552
Asn Asp	Lys Leu Pro Asn Asn	Glu Asp Arg Val Arg	Gly Ser Phe	
1825	1830	1835		
gct ttt	gat tca cct cat cat	tac acg cct att gaa	gga act cct	5597
Ala Phe	Asp Ser Pro His His	Tyr Thr Pro Ile Glu	Gly Thr Pro	
1840	1845	1850		
tac tgt	ttt tca cga aat gat	tct ttg agt tct cta	gat ttt gat	5642
Tyr Cys	Phe Ser Arg Asn Asp	Ser Leu Ser Ser Leu	Asp Phe Asp	
1855	1860	1865		
gat gat	gat gtt gac ctt tcc	agg gaa aag gct gaa	tta aga aag	5687
Asp Asp	Asp Val Asp Leu Ser	Arg Glu Lys Ala Glu	Leu Arg Lys	
1870	1875	1880		
gca aaa	gaa aat aag gaa tca	gag gct aaa gtt acc	agc cac aca	5732
Ala Lys	Glu Asn Lys Glu Ser	Glu Ala Lys Val Thr	Ser His Thr	
1885	1890	1895		
gaa cta	acc tcc aac caa caa	tca gct aat aag aca	caa gct att	5777
Glu Leu	Thr Ser Asn Gln Gln	Ser Ala Asn Lys Thr	Gln Ala Ile	
1900	1905	1910		
gca aag	cag cca ata aat cga	ggg cag cct aaa ccc	ata ctt cag	5822
Ala Lys	Gln Pro Ile Asn Arg	Gly Gln Pro Lys Pro	Ile Leu Gln	
1915	1920	1925		
aaa caa	tcc act ttt ccc cag	tca tcc aaa gac ata	cca gac aga	5867
Lys Gln	Ser Thr Phe Pro Gln	Ser Ser Lys Asp Ile	Pro Asp Arg	
1930	1935	1940		
ggg gca	gca act gat gaa aag	tta cag aat ttt gct	att gaa aat	5912
Gly Ala	Ala Thr Asp Glu Lys	Leu Gln Asn Phe Ala	Ile Glu Asn	
1945	1950	1955		
act cca	gtt tgc ttt tct cat	aat tcc tct ctg agt	tct ctc agt	5957
Thr Pro	Val Cys Phe Ser His	Asn Ser Ser Leu Ser	Ser Leu Ser	
1960	1965	1970		

gac att gac caa gaa aac aac Asp Ile Asp Gln Glu Asn Asn 1975	aat aaa gaa aat gaa Asn Lys Glu Asn Glu 1980	cct atc aaa Pro Ile Lys 1985	6002
gag act gag ccc cct gac tca Glu Thr Glu Pro Pro Asp Ser 1990	cag gga gaa cca Gln Gly Glu Pro 1995	agt aaa cct caa Ser Lys Pro Gln 2000	6047
gca tca ggc tat gct cct aaa Ala Ser Gly Tyr Ala Pro Lys 2005	tca ttt cat gtt gaa Ser Phe His Val Glu 2010	gat acc cca Asp Thr Pro 2015	6092
gtt tgt ttc tca aga aac agt Val Cys Phe Ser Arg Asn Ser 2020	tct ctc agt tct ctt Ser Leu Ser Ser Leu 2025	agt att gac Ser Ile Asp 2030	6137
tct gaa gat gac ctg ttg cag Ser Glu Asp Asp Leu Leu Gln 2035	gaa tgt ata agc tcc Glu Cys Ile Ser Ser 2040	gca atg cca Ala Met Pro 2045	6182
aaa aag aaa aag cct tca aga Lys Lys Lys Lys Pro Ser Arg 2050	ctc aag ggt gat aat Leu Lys Gly Asp Asn 2055	gaa aaa cat Glu Lys His 2060	6227
agt ccc aga aat atg ggt ggc Ser Pro Arg Asn Met Gly Gly 2065	ata tta ggt gaa gat Ile Leu Gly Glu Asp 2070	ctg aca ctt Leu Thr Leu 2075	6272
gat ttg aaa gat ata cag aga Asp Leu Lys Asp Ile Gln Arg 2080	cca gat tca gaa cat Pro Asp Ser Glu His 2085	ggg cta tcc Gly Leu Ser 2090	6317
cct gat tca gaa aat ttt gat Pro Asp Ser Glu Asn Phe Asp 2095	tgg aaa gct att cag Trp Lys Ala Ile Gln 2100	gaa ggt gca Glu Gly Ala 2105	6362
aat tcc ata gta agt agt tta Asn Ser Ile Val Ser Ser Leu 2110	cat caa gct gct gct His Gln Ala Ala Ala 2115	gct gca tgt Ala Ala Cys 2120	6407
tta tct aga caa gct tcg tct Leu Ser Arg Gln Ala Ser Ser 2125	gat tca gat tcc atc Asp Ser Asp Ser Ile 2130	ctt tcc ctg Leu Ser Leu 2135	6452
aaa tca gga atc tct ctg gga Lys Ser Gly Ile Ser Leu Gly 2140	tca cca ttt cat ctt Ser Pro Phe His Leu 2145	aca cct gat Thr Pro Asp 2150	6497
caa gaa gaa aaa ccc ttt aca Gln Glu Glu Lys Pro Phe Thr 2155	agt aat aaa ggc cca Ser Asn Lys Gly Pro 2160	cga att cta Arg Ile Leu 2165	6542
aaa cca ggg gag aaa agt aca Lys Pro Gly Glu Lys Ser Thr 2170	ttg gaa act aaa aag Leu Glu Thr Lys Lys 2175	ata gaa tct Ile Glu Ser 2180	6587
gaa agt aaa gga atc aaa gga Glu Ser Lys Gly Ile Lys Gly 2185	gga aaa aaa gtt tat Gly Lys Lys Val Tyr 2190	aaa agt ttg Lys Ser Leu 2195	6632
att act gga aaa gtt cga tct 2195	aat tca gaa att tca 2195	ggc caa atg 2195	6677

Ile	Thr	Gly	Lys	Val	Arg	Ser	Asn	Ser	Glu	Ile	Ser	Gly	Gln	Met	
	2200					2205					2210				
aaa	cag	ccc	ctt	caa	gca	aac	atg	cct	tca	atc	tct	cga	ggc	agg	6722
Lys	Gln	Pro	Leu	Gln	Ala	Asn	Met	Pro	Ser	Ile	Ser	Arg	Gly	Arg	
	2215					2220					2225				
aca	atg	att	cat	att	cca	gga	gtt	cga	aat	agc	tcc	tca	agt	aca	6767
Thr	Met	Ile	His	Ile	Pro	Gly	Val	Arg	Asn	Ser	Ser	Ser	Ser	Thr	
	2230					2235					2240				
agt	cct	gtt	tct	aaa	aaa	ggc	cca	ccc	ctt	aag	act	cca	gcc	tcc	6812
Ser	Pro	Val	Ser	Lys	Lys	Gly	Pro	Pro	Leu	Lys	Thr	Pro	Ala	Ser	
	2245					2250					2255				
aaa	agc	cct	agt	gaa	ggc	caa	aca	gcc	acc	act	tct	cct	aga	gga	6857
Lys	Ser	Pro	Ser	Glu	Gly	Gln	Thr	Ala	Thr	Thr	Ser	Pro	Arg	Gly	
	2260					2265					2270				
gcc	aag	cca	tct	gtg	aaa	tca	gaa	tta	agc	cct	gtt	gcc	agg	cag	6902
Ala	Lys	Pro	Ser	Val	Lys	Ser	Glu	Leu	Ser	Pro	Val	Ala	Arg	Gln	
	2275					2280					2285				
aca	tcc	caa	ata	ggc	ggg	tca	agt	aaa	gca	cct	tct	aga	tca	gga	6947
Thr	Ser	Gln	Ile	Gly	Gly	Ser	Ser	Lys	Ala	Pro	Ser	Arg	Ser	Gly	
	2290					2295					2300				
tct	aga	gat	tcg	acc	cct	tca	aga	cct	gcc	cag	caa	cca	tta	agt	6992
Ser	Arg	Asp	Ser	Thr	Pro	Ser	Arg	Pro	Ala	Gln	Gln	Pro	Leu	Ser	
	2305					2310					2315				
aga	cct	ata	cag	tct	cct	ggc	cga	aac	tca	att	tcc	cct	ggc	aga	7037
Arg	Pro	Ile	Gln	Ser	Pro	Gly	Arg	Asn	Ser	Ile	Ser	Pro	Gly	Arg	
	2320					2325					2330				
aat	gga	ata	agt	cct	cct	aac	aaa	tta	tct	caa	ctt	cca	agg	aca	7082
Asn	Gly	Ile	Ser	Pro	Pro	Asn	Lys	Leu	Ser	Gln	Leu	Pro	Arg	Thr	
	2335					2340					2345				
tca	tcc	cct	agt	act	gct	tca	act	aag	tcc	tca	ggc	tct	gga	aaa	7127
Ser	Ser	Pro	Ser	Thr	Ala	Ser	Thr	Lys	Ser	Ser	Gly	Ser	Gly	Lys	
	2350					2355					2360				
atg	tca	tat	aca	tct	cca	ggc	aga	cag	atg	agc	caa	cag	aac	ctt	7172
Met	Ser	Tyr	Thr	Ser	Pro	Gly	Arg	Gln	Met	Ser	Gln	Gln	Asn	Leu	
	2365					2370					2375				
acc	aaa	caa	aca	ggc	tta	tcc	aag	aat	gcc	agt	agt	att	cca	aga	7217
Thr	Lys	Gln	Thr	Gly	Leu	Ser	Lys	Asn	Ala	Ser	Ser	Ile	Pro	Arg	
	2380					2385					2390				
agt	gag	tct	gcc	tcc	aaa	gga	cta	aat	cag	atg	aat	aat	ggc	aat	7262
Ser	Glu	Ser	Ala	Ser	Lys	Gly	Leu	Asn	Gln	Met	Asn	Asn	Gly	Asn	
	2395					2400					2405				
gga	gcc	aat	aaa	aag	gta	gaa	ctt	tct	aga	atg	tct	tca	act	aaa	7307
Gly	Ala	Asn	Lys	Lys	Val	Glu	Leu	Ser	Arg	Met	Ser	Ser	Thr	Lys	
	2410					2415					2420				
tca	agt	gga	agt	gaa	tct	gat	aga	tca	gaa	aga	cct	gta	tta	gta	7352
Ser	Ser	Gly	Ser	Glu	Ser	Asp	Arg	Ser	Glu	Arg	Pro	Val	Leu	Val	

2425	2430	2435	
cgc cag tca act ttc atc aaa gaa gct cca agc cca acc tta aga 7397			
Arg Gln Ser Thr Phe Ile Lys Glu Ala Pro Ser Pro Thr Leu Arg			
2440	2445	2450	
aga aaa ttg gag gaa tct gct tca ttt gaa tct ctt tct cca tca 7442			
Arg Lys Leu Glu Glu Ser Ala Ser Phe Glu Ser Leu Ser Pro Ser			
2455	2460	2465	
tct aga cca gct tct ccc act agg tcc cag gca caa act cca gtt 7487			
Ser Arg Pro Ala Ser Pro Thr Arg Ser Gln Ala Gln Thr Pro Val			
2470	2475	2480	
tta agt cct tcc ctt cct gat atg tct cta tcc aca cat tcg tct 7532			
Leu Ser Pro Ser Leu Pro Asp Met Ser Leu Ser Thr His Ser Ser			
2485	2490	2495	
gtt cag gct ggt gga tgg cga aaa ctg cca cct aat ctg agt ccc 7577			
Val Gln Ala Gly Gly Trp Arg Lys Leu Pro Pro Asn Leu Ser Pro			
2500	2505	2510	
act ata gag tat aat gat gga aga cca gca aag cgc cat gat att 7622			
Thr Ile Glu Tyr Asn Asp Gly Arg Pro Ala Lys Arg His Asp Ile			
2515	2520	2525	
gca cgg tct cat tct gaa agt cct tct aga ctt cca atc aat agg 7667			
Ala Arg Ser His Ser Glu Ser Pro Ser Arg Leu Pro Ile Asn Arg			
2530	2535	2540	
tca gga acc tgg aaa cgt gag cac agc aaa cat tca tca tcc ctt 7712			
Ser Gly Thr Trp Lys Arg Glu His Ser Lys His Ser Ser Ser Leu			
2545	2550	2555	
cct cga gta agc act tgg aga aga act gga agt tca tct tca att 7757			
Pro Arg Val Ser Thr Trp Arg Arg Thr Gly Ser Ser Ser Ser Ile			
2560	2565	2570	
ctt tct gct tca tca gaa tcc agt gaa aaa gca aaa agt gag gat 7802			
Leu Ser Ala Ser Ser Glu Ser Ser Glu Lys Ala Lys Ser Glu Asp			
2575	2580	2585	
gaa aaa cat gtg aac tct att tca gga acc aaa caa agt aaa gaa 7847			
Glu Lys His Val Asn Ser Ile Ser Gly Thr Lys Gln Ser Lys Glu			
2590	2595	2600	
aac caa gta tcc gca aaa gga aca tgg aga aaa ata aaa gaa aat 7892			
Asn Gln Val Ser Ala Lys Gly Thr Trp Arg Lys Ile Lys Glu Asn			
2605	2610	2615	
gaa ttt tct ccc aca aat agt act tct cag acc gtt tcc tca ggt 7937			
Glu Phe Ser Pro Thr Asn Ser Thr Ser Gln Thr Val Ser Ser Gly			
2620	2625	2630	
gct aca aat ggt gct gaa tca aag act cta att tat caa atg gca 7982			
Ala Thr Asn Gly Ala Glu Ser Lys Thr Leu Ile Tyr Gln Met Ala			
2635	2640	2645	
cct gct gtt tct aaa aca gag gat gtt tgg gtg aga att gag gac 8027			
Pro Ala Val Ser Lys Thr Glu Asp Val Trp Val Arg Ile Glu Asp			
2650	2655	2660	

tgt ccc att aac aat cct aga tct gga aga tct ccc aca ggt aat	8072
Cys Pro Ile Asn Asn Pro Arg Ser Gly Arg Ser Pro Thr Gly Asn	
2665 2670 2675	
act ccc ccg gtg att gac agt gtt tca gaa aag gca aat cca aac	8117
Thr Pro Pro Val Ile Asp Ser Val Ser Glu Lys Ala Asn Pro Asn	
2680 2685 2690	
att aaa gat tca aaa gat aat cag gca aaa caa aat gtg ggt aat	8162
Ile Lys Asp Ser Lys Asp Asn Gln Ala Lys Gln Asn Val Gly Asn	
2695 2700 2705	
ggc agt gtt ccc atg cgt acc gtg ggt ttg gaa aat cgc ctg aac	8207
Gly Ser Val Pro Met Arg Thr Val Gly Leu Glu Asn Arg Leu Asn	
2710 2715 2720	
tcc ttt att cag gtg gat gcc cct gac caa aaa gga act gag ata	8252
Ser Phe Ile Gln Val Asp Ala Pro Asp Gln Lys Gly Thr Glu Ile	
2725 2730 2735	
aaa cca gga caa aat aat cct gtc cct gta tca gag act aat gaa	8297
Lys Pro Gly Gln Asn Asn Pro Val Pro Val Ser Glu Thr Asn Glu	
2740 2745 2750	
agt tct ata gtg gaa cgt acc cca ttc agt tct agc agc tca agc	8342
Ser Ser Ile Val Glu Arg Thr Pro Phe Ser Ser Ser Ser Ser Ser	
2755 2760 2765	
aaa cac agt tca cct agt ggg act gtt gct gcc aga gtg act cct	8387
Lys His Ser Ser Pro Ser Gly Thr Val Ala Ala Arg Val Thr Pro	
2770 2775 2780	
ttt aat tac aac cca agc cct agg aaa agc agc gca gat agc act	8432
Phe Asn Tyr Asn Pro Ser Pro Arg Lys Ser Ser Ala Asp Ser Thr	
2785 2790 2795	
tca gct cgg cca tct cag atc cca act cca gtg aat aac aac aca	8477
Ser Ala Arg Pro Ser Gln Ile Pro Thr Pro Val Asn Asn Asn Thr	
2800 2805 2810	
aag aag cga gat tcc aaa act gac agc aca gaa tcc agt gga acc	8522
Lys Lys Arg Asp Ser Lys Thr Asp Ser Thr Glu Ser Ser Gly Thr	
2815 2820 2825	
caa agt cct aag cgc cat tct ggg tct tac ctt gtg aca tct gtt	8567
Gln Ser Pro Lys Arg His Ser Gly Ser Tyr Leu Val Thr Ser Val	
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His Leu Thr Lys Leu Glu Thr Glu Ala Ser Asn Met Lys Glu Val Leu  
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Lys Gln Leu Gln Gly Ser Ile Glu Asp Glu Ala Met Ala Ser Ser Gly  
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Gln Ile Asp Leu Leu Glu Arg Leu Lys Glu Leu Asn Leu Asp Ser Ser  
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Asn Phe Pro Gly Val Lys Leu Arg Ser Lys Met Ser Leu Arg Ser Tyr  
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Gly Ser Arg Glu Gly Ser Val Ser Ser Arg Ser Gly Glu Cys Ser Pro  
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Val Pro Met Gly Ser Phe Pro Arg Arg Gly Phe Val Asn Gly Ser Arg  
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Glu Ser Thr Gly Tyr Leu Glu Glu Leu Glu Lys Glu Arg Ser Leu Leu  
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Leu Ala Asp Leu Asp Lys Glu Glu Lys Glu Lys Asp Trp Tyr Tyr Ala  
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Gln Leu Gln Asn Leu Thr Lys Arg Ile Asp Ser Leu Pro Leu Thr Glu  
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Asn Phe Ser Leu Gln Thr Asp Met Thr Arg Arg Gln Leu Glu Tyr Glu  
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Ala Arg Gln Ile Arg Val Ala Met Glu Glu Gln Leu Gly Thr Cys Gln  
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Asp Met Glu Lys Arg Ala Gln Arg Arg Ile Ala Arg Ile Gln Gln Ile  
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Glu Lys Asp Ile Leu Arg Ile Arg Gln Leu Leu Gln Ser Gln Ala Thr  
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Glu Ala Glu Arg Ser Ser Gln Asn Lys His Glu Thr Gly Ser His Asp  
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Ala Glu Arg Gln Asn Glu Gly Gln Gly Val Gly Glu Ile Asn Met Ala  
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Thr Ser Gly Asn Gly Gln Gly Ser Thr Thr Arg Met Asp His Glu Thr  
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Ala Ser Val Leu Ser Ser Ser Ser Thr His Ser Ala Pro Arg Arg Leu  
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Thr Ser His Leu Gly Thr Lys Val Glu Met Val Tyr Ser Leu Leu Ser  
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Met Leu Gly Thr His Asp Lys Asp Asp Met Ser Arg Thr Leu Leu Ala  
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Met Ser Ser Ser Gln Asp Ser Cys Ile Ser Met Arg Gln Ser Gly Cys  
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Leu Pro Leu Leu Ile Gln Leu Leu His Gly Asn Asp Lys Asp Ser Val  
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Leu Leu Gly Asn Ser Arg Gly Ser Lys Glu Ala Arg Ala Arg Ala Ser  
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Ala Ala Leu His Asn Ile Ile His Ser Gln Pro Asp Asp Lys Arg Gly  
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Arg Arg Glu Ile Arg Val Leu His Leu Leu Glu Gln Ile Arg Ala Tyr  
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Cys Glu Thr Cys Trp Glu Trp Gln Glu Ala His Glu Pro Gly Met Asp  
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Gln Asp Lys Asn Pro Met Pro Ala Pro Val Glu His Gln Ile Cys Pro  
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Ala Val Cys Val Leu Met Lys Leu Ser Phe Asp Glu Glu His Arg His  
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Ala Met Asn Glu Leu Gly Gly Leu Gln Ala Ile Ala Glu Leu Leu Gln  
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Val Asp Cys Glu Met Tyr Gly Leu Thr Asn Asp His Tyr Ser Ile Thr  
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Leu Arg Arg Tyr Ala Gly Met Ala Leu Thr Asn Leu Thr Phe Gly Asp

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Lys	Thr	Leu	Arg	Glu	Val	Gly	Ser	Val	Lys	Ala	Leu	Met	Glu	Cys	Ala
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				595					600					605	
Val	Asp	Gly	Ala	Leu	Ala	Phe	Leu	Val	Gly	Thr	Leu	Thr	Tyr	Arg	Ser
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Gln	Thr	Asn	Thr	Leu	Ala	Ile	Ile	Glu	Ser	Gly	Gly	Gly	Ile	Leu	Arg
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Arg	Glu	Asn	Asn	Cys	Leu	Gln	Thr	Leu	Leu	Gln	His	Leu	Lys	Ser	His
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Ser	Leu	Thr	Ile	Val	Ser	Asn	Ala	Cys	Gly	Thr	Leu	Trp	Asn	Leu	Ser
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Ala	Arg	Asn	Pro	Lys	Asp	Gln	Glu	Ala	Leu	Trp	Asp	Met	Gly	Ala	Val
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Gly	Ser	Ala	Ala	Ala	Leu	Arg	Asn	Leu	Met	Ala	Asn	Arg	Pro	Ala	Lys
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Tyr	Lys	Asp	Ala	Asn	Ile	Met	Ser	Pro	Gly	Ser	Ser	Leu	Pro	Ser	Leu
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His Arg Ser Lys Gln Arg His Lys Gln Ser Leu Tyr Gly Asp Tyr Val  
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Phe Asp Thr Asn Arg His Asp Asp Asn Arg Ser Asp Asn Phe Asn Thr  
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Gly Asn Met Thr Val Leu Ser Pro Tyr Leu Asn Thr Thr Val Leu Pro  
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Ser Ser Ser Ser Ser Arg Gly Ser Leu Asp Ser Ser Arg Ser Glu Lys  
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Asp Arg Ser Leu Glu Arg Glu Arg Gly Ile Gly Leu Gly Asn Tyr His  
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Pro Ala Thr Glu Asn Pro Gly Thr Ser Ser Lys Arg Gly Leu Gln Ile  
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Ser Thr Thr Ala Ala Gln Ile Ala Lys Val Met Glu Glu Val Ser Ala  
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Ile His Thr Ser Gln Glu Asp Arg Ser Ser Gly Ser Thr Thr Glu Leu  
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His Cys Val Thr Asp Glu Arg Asn Ala Leu Arg Arg Ser Ser Ala Ala  
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His Thr His Ser Asn Thr Tyr Asn Phe Thr Lys Ser Glu Asn Ser Asn  
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Arg Thr Cys Ser Met Pro Tyr Ala Lys Leu Glu Tyr Lys Arg Ser Ser  
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Asn Asp Ser Leu Asn Ser Val Ser Ser Ser Asp Gly Tyr Gly Lys Arg  
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Gly Gln Met Lys Pro Ser Ile Glu Ser Tyr Ser Glu Asp Asp Glu Ser  
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Lys Phe Cys Ser Tyr Gly Gln Tyr Pro Ala Asp Leu Ala His Lys Ile  
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His Ser Ala Asn His Met Asp Asp Asn Asp Gly Glu Leu Asp Thr  
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Pro Ile Asn Tyr Ser Leu Lys Tyr Ser Asp Glu Gln Leu Asn Ser  
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Gly Arg Gln Ser Pro Ser Gln Asn Glu Arg Trp Ala Arg Pro Lys  
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His Ile Ile Glu Asp Glu Ile Lys Gln Ser Glu Gln Arg Gln Ser  
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Arg Asn Gln Ser Thr Thr Tyr Pro Val Tyr Thr Glu Ser Thr Asp  
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Asp Lys His Leu Lys Phe Gln Pro His Phe Gly Gln Gln Glu Cys  
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Val Ser Pro Tyr Arg Ser Arg Gly Ala Asn Gly Ser Glu Thr Asn  
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Arg Val Gly Ser Asn His Gly Ile Asn Gln Asn Val Ser Gln Ser  
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Leu Cys Gln Glu Asp Asp Tyr Glu Asp Asp Lys Pro Thr Asn Tyr  
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Ser Glu Arg Tyr Ser Glu Glu Glu Gln His Glu Glu Glu Glu Arg  
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Pro Thr Asn Tyr Ser Ile Lys Tyr Asn Glu Glu Lys Arg His Val  
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Asp Gln Pro Ile Asp Tyr Ser Leu Lys Tyr Ala Thr Asp Ile Pro  
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Ser Ser Gln Lys Gln Ser Phe Ser Phe Ser Lys Ser Ser Ser Gly  
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Gln Ser Ser Lys Thr Glu His Met Ser Ser Ser Ser Glu Asn Thr  
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Ser	Ser	Ala	Gln	Ser	Arg	Ser	Gly	Gln	Pro	Gln	Lys	Ala	Ala	Thr
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Cys	Lys	Val	Ser	Ser	Ile	Asn	Gln	Glu	Thr	Ile	Gln	Thr	Tyr	Cys
1250						1255					1260			
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1265						1270					1275			
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1280						1285					1290			
Gln	Glu	Ala	Asp	Ser	Ala	Asn	Thr	Leu	Gln	Ile	Ala	Glu	Ile	Lys
1295						1300					1305			
Glu	Lys	Ile	Gly	Thr	Arg	Ser	Ala	Glu	Asp	Pro	Val	Ser	Glu	Val
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Pro	Ala	Val	Ser	Gln	His	Pro	Arg	Thr	Lys	Ser	Ser	Arg	Leu	Gln
1325						1330					1335			
Gly	Ser	Ser	Leu	Ser	Ser	Glu	Ser	Ala	Arg	His	Lys	Ala	Val	Glu
1340						1345					1350			
Phe	Ser	Ser	Gly	Ala	Lys	Ser	Pro	Ser	Lys	Ser	Gly	Ala	Gln	Thr
1355						1360					1365			
Pro	Lys	Ser	Pro	Pro	Glu	His	Tyr	Val	Gln	Glu	Thr	Pro	Leu	Met
1370						1375					1380			
Phe	Ser	Arg	Cys	Thr	Ser	Val	Ser	Ser	Leu	Asp	Ser	Phe	Glu	Ser
1385						1390					1395			
Arg	Ser	Ile	Ala	Ser	Ser	Val	Gln	Ser	Glu	Pro	Cys	Ser	Gly	Met
1400						1405					1410			
Val	Ser	Gly	Ile	Ile	Ser	Pro	Ser	Asp	Leu	Pro	Asp	Ser	Pro	Gly
1415						1420					1425			
Gln	Thr	Met	Pro	Pro	Ser	Arg	Ser	Lys	Thr	Pro	Pro	Pro	Pro	Pro
1430						1435					1440			
Gln	Thr	Ala	Gln	Thr	Lys	Arg	Glu	Val	Pro	Lys	Asn	Lys	Ala	Pro

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Thr Ala Glu Lys Arg Glu Ser Gly Pro Lys Gln Ala Ala Val Asn				
1460		1465		1470
Ala Ala Val Gln Arg Val Gln Val Leu Pro Asp Ala Asp Thr Leu				
1475		1480		1485
Leu His Phe Ala Thr Glu Ser Thr Pro Asp Gly Phe Ser Cys Ser				
1490		1495		1500
Ser Ser Leu Ser Ala Leu Ser Leu Asp Glu Pro Phe Ile Gln Lys				
1505		1510		1515
Asp Val Glu Leu Arg Ile Met Pro Pro Val Gln Glu Asn Asp Asn				
1520		1525		1530
Gly Asn Glu Thr Glu Ser Glu Gln Pro Lys Glu Ser Asn Glu Asn				
1535		1540		1545
Gln Glu Lys Glu Ala Glu Lys Thr Ile Asp Ser Glu Lys Asp Leu				
1550		1555		1560
Leu Asp Asp Ser Asp Asp Asp Asp Ile Glu Ile Leu Glu Glu Cys				
1565		1570		1575
Ile Ile Ser Ala Met Pro Thr Lys Ser Ser Arg Lys Ala Lys Lys				
1580		1585		1590
Pro Ala Gln Thr Ala Ser Lys Leu Pro Pro Pro Val Ala Arg Lys				
1595		1600		1605
Pro Ser Gln Leu Pro Val Tyr Lys Leu Leu Pro Ser Gln Asn Arg				
1610		1615		1620
Leu Gln Pro Gln Lys His Val Ser Phe Thr Pro Gly Asp Asp Met				
1625		1630		1635
Pro Arg Val Tyr Cys Val Glu Gly Thr Pro Ile Asn Phe Ser Thr				
1640		1645		1650
Ala Thr Ser Leu Ser Asp Leu Thr Ile Glu Ser Pro Pro Asn Glu				
1655		1660		1665
Leu Ala Ala Gly Glu Gly Val Arg Gly Gly Ala Gln Ser Gly Glu				
1670		1675		1680



Phe	Glu	Lys	Arg	Asp	Thr	Ile	Pro	Thr	Glu	Gly	Arg	Ser	Thr	Asp
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Glu	Ala	Gln	Gly	Gly	Lys	Thr	Ser	Ser	Val	Thr	Ile	Pro	Glu	Leu
1700						1705					1710			
Asp	Asp	Asn	Lys	Ala	Glu	Glu	Gly	Asp	Ile	Leu	Ala	Glu	Cys	Ile
1715						1720					1725			
Asn	Ser	Ala	Met	Pro	Lys	Gly	Lys	Ser	His	Lys	Pro	Phe	Arg	Val
1730						1735					1740			
Lys	Lys	Ile	Met	Asp	Gln	Val	Gln	Gln	Ala	Ser	Ala	Ser	Ser	Ser
1745						1750					1755			
Ala	Pro	Asn	Lys	Asn	Gln	Leu	Asp	Gly	Lys	Lys	Lys	Lys	Pro	Thr
1760						1765					1770			
Ser	Pro	Val	Lys	Pro	Ile	Pro	Gln	Asn	Thr	Glu	Tyr	Arg	Thr	Arg
1775						1780					1785			
Val	Arg	Lys	Asn	Ala	Asp	Ser	Lys	Asn	Asn	Leu	Asn	Ala	Glu	Arg
1790						1795					1800			
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1805						1810					1815			
Asn	Ser	Lys	Asp	Phe	Asn	Asp	Lys	Leu	Pro	Asn	Asn	Glu	Asp	Arg
1820						1825					1830			
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Ser	Leu	Asp	Phe	Asp	Asp	Asp	Asp	Val	Asp	Leu	Ser	Arg	Glu	Lys
1865						1870					1875			
Ala	Glu	Leu	Arg	Lys	Ala	Lys	Glu	Asn	Lys	Glu	Ser	Glu	Ala	Lys
1880						1885					1890			
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1895						1900					1905			

Lys Thr Gln Ala Ile Ala Lys Gln Pro Ile Asn Arg Gly Gln Pro 1910 1915 1920
Lys Pro Ile Leu Gln Lys Gln Ser Thr Phe Pro Gln Ser Ser Lys 1925 1930 1935
Asp Ile Pro Asp Arg Gly Ala Ala Thr Asp Glu Lys Leu Gln Asn 1940 1945 1950
Phe Ala Ile Glu Asn Thr Pro Val Cys Phe Ser His Asn Ser Ser 1955 1960 1965
Leu Ser Ser Leu Ser Asp Ile Asp Gln Glu Asn Asn Asn Lys Glu 1970 1975 1980
Asn Glu Pro Ile Lys Glu Thr Glu Pro Pro Asp Ser Gln Gly Glu 1985 1990 1995
Pro Ser Lys Pro Gln Ala Ser Gly Tyr Ala Pro Lys Ser Phe His 2000 2005 2010
Val Glu Asp Thr Pro Val Cys Phe Ser Arg Asn Ser Ser Leu Ser 2015 2020 2025
Ser Leu Ser Ile Asp Ser Glu Asp Asp Leu Leu Gln Glu Cys Ile 2030 2035 2040
Ser Ser Ala Met Pro Lys Lys Lys Lys Pro Ser Arg Leu Lys Gly 2045 2050 2055
Asp Asn Glu Lys His Ser Pro Arg Asn Met Gly Gly Ile Leu Gly 2060 2065 2070
Glu Asp Leu Thr Leu Asp Leu Lys Asp Ile Gln Arg Pro Asp Ser 2075 2080 2085
Glu His Gly Leu Ser Pro Asp Ser Glu Asn Phe Asp Trp Lys Ala 2090 2095 2100
Ile Gln Glu Gly Ala Asn Ser Ile Val Ser Ser Leu His Gln Ala 2105 2110 2115
Ala Ala Ala Ala Cys Leu Ser Arg Gln Ala Ser Ser Asp Ser Asp 2120 2125 2130

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2165						2170					2175			
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2180						2185					2190			
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2195						2200					2205			
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2210						2215					2220			
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2225						2230					2235			
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2240						2245					2250			
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2255						2260					2265			
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2270						2275					2280			
Pro	Val	Ala	Arg	Gln	Thr	Ser	Gln	Ile	Gly	Gly	Ser	Ser	Lys	Ala
2285						2290					2295			
Pro	Ser	Arg	Ser	Gly	Ser	Arg	Asp	Ser	Thr	Pro	Ser	Arg	Pro	Ala
2300						2305					2310			
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2315						2320					2325			
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2330						2335					2340			
Gln	Leu	Pro	Arg	Thr	Ser	Ser	Pro	Ser	Thr	Ala	Ser	Thr	Lys	Ser
2345						2350					2355			
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2360							2365					2370				
Ser	Gln	Gln	Asn	Leu	Thr	Lys	Gln	Thr	Gly	Leu	Ser	Lys	Asn	Ala		
2375						2380					2385					
Ser	Ser	Ile	Pro	Arg	Ser	Glu	Ser	Ala	Ser	Lys	Gly	Leu	Asn	Gln		
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Ser	Thr	His	Ser	Ser	Val	Gln	Ala	Gly	Gly	Trp	Arg	Lys	Leu	Pro		
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Pro	Asn	Leu	Ser	Pro	Thr	Ile	Glu	Tyr	Asn	Asp	Gly	Arg	Pro	Ala		
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Lys	Arg	His	Asp	Ile	Ala	Arg	Ser	His	Ser	Glu	Ser	Pro	Ser	Arg		
2525						2530					2535					
Leu	Pro	Ile	Asn	Arg	Ser	Gly	Thr	Trp	Lys	Arg	Glu	His	Ser	Lys		
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Ser	Ser	Ser	Ser	Ile	Leu	Ser	Ala	Ser	Ser	Glu	Ser	Ser	Glu	Lys		
2570						2575					2580					
Ala	Lys	Ser	Glu	Asp	Glu	Lys	His	Val	Asn	Ser	Ile	Ser	Gly	Thr		
2585						2590					2595					

Lys	Gln	Ser	Lys	Glu	Asn	Gln	Val	Ser	Ala	Lys	Gly	Thr	Trp	Arg
2600						2605					2610			
Lys	Ile	Lys	Glu	Asn	Glu	Phe	Ser	Pro	Thr	Asn	Ser	Thr	Ser	Gln
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2630						2635					2640			
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2645						2650					2655			
Val	Arg	Ile	Glu	Asp	Cys	Pro	Ile	Asn	Asn	Pro	Arg	Ser	Gly	Arg
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2675						2680					2685			
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2705						2710					2715			
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2720						2725					2730			
Lys	Gly	Thr	Glu	Ile	Lys	Pro	Gly	Gln	Asn	Asn	Pro	Val	Pro	Val
2735						2740					2745			
Ser	Glu	Thr	Asn	Glu	Ser	Ser	Ile	Val	Glu	Arg	Thr	Pro	Phe	Ser
2750						2755					2760			
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2765						2770					2775			
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2780						2785					2790			
Ser	Ala	Asp	Ser	Thr	Ser	Ala	Arg	Pro	Ser	Gln	Ile	Pro	Thr	Pro
2795						2800					2805			
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 ttttggaatt cgaggcgagg attttttttcg ttttatcggt ttagtttttt cgaggagttcg 180  
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 gcgttggggtg cgcgcgggag ggttttcgag cgggtttcgt cgttggtcgt gttgcgagcg 360  
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 tttttttaag agtggttgta tttttcgttt gcgtttcgta attgttttgg gtgaaaatgg 480  
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